feast. Roy Buck and another acted as floor managers, picking out the singers and dance leaders.

Leading off with the Trotting or Standing Quiver Dance, Onondaga Chiefs Peter Buck and Joe Logan turned out all the chiefs from both sides. They chugged around in fine humor, Pete Buck leading and Joe Logan supporting him, and the column of chiefs rubbing antlers was soon lengthened by a throng of dancers until the circle lapped itself three times. One wondered that these old men could keep up the pace.

Tcin'ha', or Garter Dance, came next. Roy Buck and Billy Buck, a famous singer, were the leaders. They soon had a throng following them. By this time the house was filled with dust and smoke and the heat of dancing. Outside couples were walking around the building cooling off. John Buck III, who lays cable for the telephone company in Hamilton, approached me because he understood that I had succeeded John Hewitt who had employed his father as informant. While we were talking, Jake Styres joined us, also the son of a chief who had served Hewitt. Jake might have been Deputy Chief to the newly installed Haga'-en'yonk, but he had demurred when the matron approached him. Employed for years as a miller in Caledonia, he has been too long among the white people, and matters relating to chiefship, he said, were too deep for him. Successful though they may be, the younger Iroquois decline to accept such responsibility lightly. He, too, was seeing his first Condolence.

We returned inside for the Fish Dance. It was now after 11 o'clock. The crowd danced until after 12, we were told, but we went out to our cars that were now covered with frost and drove home to Ohsweken to put down our heads for the night.

ZOOLOGY.—*Rhizocephala from New England and the Grand Banks.*[1] EDWARD G. REINHARD, Catholic University of America.

This paper, although dealing with only three species, includes all but one of the Rhizocephala at present known from the North American coast between Cape Cod on the south and Newfoundland on the north. The three discussed here are parasites of hermit crabs. The other species known to occur within this region is *Sylon hippolytes* M. Sars, which Hoek (1888) reported under the name *S. challengeri* as a parasite of the shrimp *Spirontocaris spinus* collected by the *Challenger* Expedition off Halifax, Nova Scotia.

The Rhizocephala from Greenland and Canadian waters, together with others from the eastern North Atlantic, have been treated in an extensive paper by Boschma (1928). Two of the species we include here were covered by Boschma from the standpoint of anatomy, taxonomy, and distribution, viz. *Peltogaster paguri* Rathke and *Clistosaccus paguri* Lilljeborg. Discussion of these will therefore be limited to new information on geographical distribution and notes on the larval stages of the first mentioned. The remaining species is new and its description is published herewith.

The collections of the United States National Museum, through the kindness of Dr. Waldo L. Schmitt, have been used in the preparation of this article. It also contains hitherto unpublished results of field work done by the author at Woods Hole, Mass., and Lamoine, Maine.

Family PELTOGASTERIDAE Lilljeborg
Genus **Peltogaster** Rathke
Peltogaster paguri Rathke

Fig. 1

Material examined.—All the specimens enumerated in the following list were found on *Pagurus pubescens* Kröyer:

Off Newfoundland, 45° 44′ 00″ N., 49° 45′ 00″ W., 35 fathoms, June 25, 1885; three specimens on three hosts, *Albatross* coll. U.S.N.M. no. 80456. (Sectioned one.)

Off Nova Scotia, 44° 28′ 00″ N., 60° 15′ 15″ W., 36 fathoms, July 7, 1885, eight specimens

[1] Received December 18, 1945.

on eight hosts, *Albatross* coll. U.S.N.M. no. 80453. (Sectioned one.)

Off Nova Scotia, 43° 37′ 00″ N., 49° 56′ 30″ W., 36 fathoms, June 24, 1885, two specimens on two hosts, *Albatross* coll. U.S.N.M. 80455.

Frenchmans Bay, Maine, littoral zone, July and August, 1938–1941, 455 specimens on 424 hosts, E. G. Reinhard coll. (Sectioned many.)

Casco Bay, Maine, 1873, one specimen on one host, U. S. Fish Comm. coll. U.S.N.M. 80458. (Examined by clearing.)

Off Cape Cod, Mass., 42° 01′ 00″ N., 68° 00′ 30″ W., 86 fathoms, August 30, 1883, one specimen on one host, *Albatross* coll. U.S.N.M. no. 80457. (Examined by clearing.)

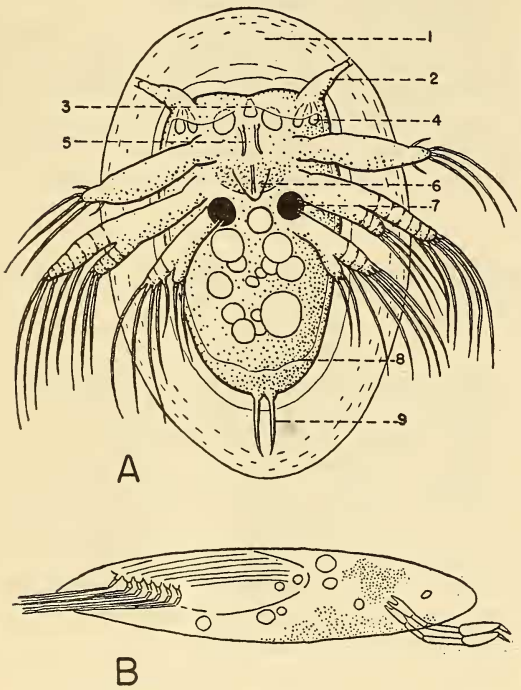

FIG. 1.—Larval stages of *Peltogaster paguri* Rathke: *A*, Early nauplius, about 24 hours after hatching, ×150; *B*, cypris larva as it appears when serving as a complemental male, ×150. (1, dorsal shield; 2, frontal horns; 3, unpigmented eye; 4, frontal glands; 5, frontal filaments; 6, labrum; 7, pigmented vesicle; 8, inner margin of dorsal shield; 9, caudal spines.)

Peltogaster paguri was first recorded for North America by A. S. Packard, Jr. (1866), who found a single specimen at Eastport, Maine. Boschma (1928) questioned the validity of this record and more so that of S. I. Smith (1884) who mentions this rhizocephalid on *Pagurus pubescens* off Laborador. His contention was that these two localities lie too far north for this species and that in all probability the parasite in question was *Clistosaccus paguri*.

It is now possible to state on the basis of the distribution records given in the present paper that Packard's identification was doubtless correct. The occurrence of *Peltogaster paguri* on the coast of Labrador, however, must still be held suspect.

Larval stages.—Nilsson-Cantell (1921) described and figured the first stage nauplius larva of *Peltogaster paguri*. In essential details his figure is a good representation of the nauplius before it is quite ready for expulsion from the mantle cavity. The shape then is somewhat triangular, and the frontal horns are directed outward and slightly backward. The size at this time is about 0.21 mm.

The nauplius described here (Fig. 1, A) is the free-swimming larva some 24 hours after it has been normally expelled from the mantle cavity. In this stage it is longer, about 0.28 mm excluding the shield, and somewhat egg-shaped in dorsal view. The frontal horns are now tilted forward and the anterior margin of the animal, while still convex, is slightly incised in front of the eye.

A prominent dorsal shield, extending beyond the tips of the frontal horns and the caudal spines, encloses the frontal, lateral, and caudal margins of the animal. It is a transparent, girdle-like covering, marked with ribs that form small diamond-shaped patterns.

The larva itself is colorless, as are the numerous fat droplets that it contains, but it possesses two pigmented vesicles, golden-orange in color, located at the level of the third pair of appendages, which are very distinctive in the living animal. The eye is unpigmented.

In side view the dorsal surface of the nauplius is convex, the ventral surface somewhat flattened except for an indentation at the anterior margin of the abdomen. The first and third pairs of appendages are about equal in length, while the second pair is slightly longer. All bear long hairs at the distal extremities. The number and position of these hairs are shown in the drawing. The spines at the tip of the abdomen are fairly long and slender. Mouth, alimentary tract, and anus are absent. Labrum and frontal filaments are present as in other rhizocephalan nauplii.

It is difficult to understand why Nilsson-Cantell remarks that in the larva of *Pelto-*

gaster paguri "ein deutlich abgesetztes Rückenschild fehlt." The dorsal shield is present in the majority of nauplii that are normally released from the egg membranes, but since it is not very securely fastened to the animal it may often be lost. It is possible, however, that the nauplii that Nilsson-Cantell studied were too immature to possess a distinct dorsal shield.

The cypris male (Fig. 1, B) is a slender larva entirely enclosed in a bivalve shell except for the antennae which project considerably beyond its anterior edge. The dimensions of the shell average 0.37 mm in length, 0.08 mm in height, and 0.03 mm in thickness. Its surface is smooth and colorless. The living animal within the shell shows spheres of orange color, which are scattered fat globules of various sizes.

The prominent antennae resemble a pair of grasping legs. Each is composed of four segments attached to a forklike tendon at the base. The first two segments are cylindrical, the third is broadened somewhat, and the fourth forms a sharp spine for piercing. These organs are inserted at a distance of about half their length from the extreme forward tip of the shell and emerge through the ventral gap between the valves. A small eye spot is located in front of the antennal tendons. The only other visible appendages are the short swimming legs. These consist of a basal segment and two small rami, each ramus being 2-segmented and terminating in several long stiff hairs that project through the posterior gap of the shell to form a conspicuous caudal tuft.

Clusters of these cypris larvae have been found on a number of occasions within the incipient mantle openings of the very young external sacs of *Peltogaster*, and a previous paper has dealt with their function in the reproductive cycle of this species (Reinhard, 1942a).

Peltogaster naushonensis, n. sp.

Fig. 2

The host of this rhizocephalid is a small hermit crab *Pagurus annulipes* (Stimpson), which is abundant and of general distribution throughout Vineyard Sound and Buzzards Bay on every sort of bottom from 2 to 17 fathoms (Sumner, Osburn, and Cole, 1913). It is rather surprising that this parasite has escaped observation until now, and credit is due Martin D. Burkenroad for calling the author's attention to it. Mr. Burkenroad brought in a live specimen at Woods Hole, Mass., on August 25, 1943. A few days later the author examined 35 hosts from the same locality and obtained one additional specimen. During the following summer Dr. John A. O'Brien, Jr., secured two more examples of this parasite through examination of 36 *P. annulipes*, also at Woods Hole. The infestation rate therefore appears to be about 4 to 5 percent.

Sections were made of the first two specimens obtained. One set of sections, designated as the type, has been deposited in the collections of the U. S. National Museum.

Types.—Holotype, U.S.N.M. no. 80916 (five slides), Tarpaulin Cove, Naushon Island, Vineyard Sound, Mass., 8 fathoms, on *Pagurus annulipes* (Stimpson), collected August 25, 1943, by M. D. Burkenroad; paratype, U.S.N.M. no. 80917 (whole specimen), Woods Hole, Mass., collected August 1944 by J. A. O'Brien, Jr.

Diagnosis.—Sacs solitary, length about two and one-half times breadth; stalk at center af dorsal surface with small shield; mantle opening at anterior end. Colleteric glands simple, accompanied by ganglion near their midregion. Testes short and saccular, at region of stalk, with long straight vasa deferentia. Retinacula absent.

Description.—The living animal is pale pink in color and its roots light green. The external sac is small, in conformity with the size of the host, and measures in the type specimen 4 mm in length and about 1.5 mm in width and thickness. The other specimens were of the following dimensions: 3.2 mm by 1.2 mm; 3.0 mm by 1.2 mm; 2.8 mm by 1.1 mm.

The mantle opening has the form of an elliptical slit guarded by an elevated sphincter. The stalk is located at the center of the dorsal surface and arises from a thin slipper-shaped chitinous shield. In its general external features the animal resembles a small *Peltogaster paguri* except that it is already mature at a size when the latter species would be less than half-grown. All four specimens had the mantle cavity filled with eggs.

The mantle is rather thin and measures 13μ to 18μ in thickness over much of its extent, although occasional areas may measure as much as 45μ. In the type specimen the visceral mass is distended with strings of eggs and has an obovate form in cross section. In the other

specimen sectioned the form of the visceral mass is much narrower since ovarian eggs are relatively few.

In studying the serial sections in order, the colleteric glands appear first. These begin immediately in front of the shield and continue to the level of the middle of the stalk. They are dorsolateral in position and have a simple or forked lumen. Just before reaching the stalk the sections begin to show the ganglion, whose main mass coincides with the anterior edge of the stalk. The ganglion has the appearance of a squat triangle, its apex extending ventrally between the colleteric glands and its base directed toward the shield.

The left testis begins immediately behind the ganglion and appears in the same sections which contain the posterior portions of the colleteric glands. The right testis begins somewhat farther back, posterior to the colleteric glands. Both are short bag-shaped organs whose entire extent is confined to the limits of the stalk. Each measures about 130μ in length. The testes are enveloped by a heavy connective tissue theca of wavy fibers but do not possess a basement membrane.

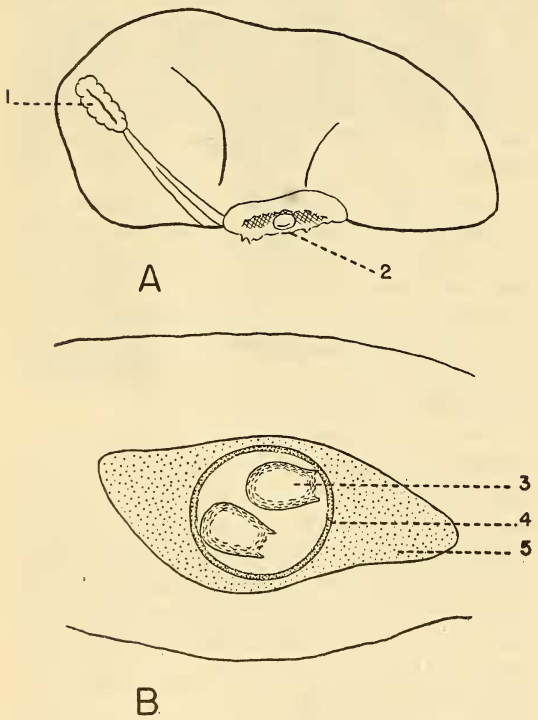

FIG. 2.—*Peltogaster naushonensis*, n. sp.: *A*, Ventrolateral view of type specimen from *Pagurus annulipes* (Stimpson), Woods Hole, Mass., ×15; *B*, portion of cleared specimen, region of stalk, showing position and shape of testes, ×70. (1, mantle opening; 2, attachment to host; 3, right testis; 4, stalk; 5, chitinous shield.)

The vasa deferentia are about twice as long as the testes. They emerge abruptly and extend as straight tubes a distance of about 264μ to emerge on the lateral surface of the visceral mass near the posterior limit of dorsal shield.

In the shape of the testes, the position of the ganglion, the uncoiled vasa deferentia, and the absence of retinacula this species is sharply distinguished from *Peltogaster paguri* Rathke.

Family CLISTOSACCIDAE Boschma
Genus **Clistosaccus** Lilljeborg
Clistosaccus paguri Lilljeborg

Material examined.—Off Newfoundland, 45° 44′ 00″ N., 49° 45′ 00″ W., 35 fathoms, June 25, 1885; one specimen on *Pagurus pubescens* Kröyer, *Albatross* coll. (Sectioned.)

Off Nova Scotia, 44° 28′ 00″ N., 60° 15′ 15″ W., 36 fathoms, July 7, 1885; four specimens on one *Pagurus pubescens* Kröyer, *Albatross* coll. U.S.N.M. no. 80454. (Sectioned one.)

Clistosaccus paguri has previously been collected in the Atlantic waters of the Western Hemisphere only from the west coast of Greenland (Boschma, 1928). These records extend the known range of this species south to the Grand Banks, where it overlaps the northern limit of *Peltogaster paguri* Rathke. At both stations *Clistosaccus paguri* and *Peltogaster paguri* were present on the same species of host crab.

The specimen collected off Newfoundland measured 20 mm in length. It was sectioned and gave evidence of being a senescent individual with degenerating visceral mass and greatly atrophied testis and colleteric glands. The four parasites on the other crab varied from 11 to 13 mm in length. This host, a female of 20 mm carapace length, also bore two scars where former parasites had been attached. One of the larger clistosaccids was sectioned and the internal anatomy was found to be characteristic of this species.

The first-mentioned specimen and three of the four others were unusual in having the mantle opening directed backward. Such a reversed orientation often occurs in cases of multiple parasitism (Reinhard, 1942b). The C-shaped mantle opening and broad stalk of attachment, important external diagnostic

features pointed out in the case of specimens from the Northwest Pacific (Reinhard, 1944), were likewise present in these specimens from the North Atlantic.

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PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

GEOLOGICAL SOCIETY

625TH MEETING

The 625th meeting of the Society was held at the Cosmos Club, January 10, 1945, President L. W. CURRIER presiding.

Informal communication.—C. MILTON discussed caliche-top-coated cobbles from a glacial moraine in northwestern New Jersey.

Program.—C. L. GORDON: *Attack of minerals by acids at elevated temperatures.* Refractory metals and alloys of the platinum group, such as the native grain platinum minerals, can be easily prepared for analysis by solution with hydrochloric acid and suitable oxidants in sealed tubes at temperatures up to 300° C. The method is less laborious than preparing solutions by fusion methods and has another advantage in that the solution obtained does not contain undesirable amounts of alkali salts. The solution of many refractory oxides and silicate minerals is successfully attained by the simple method of sealing the mineral with hydrochloric acid in a Pyrex glass tube and heating. On the microscale this method requires no other precaution than that the heating be conducted in a uniform manner.

Details of the sealed tube technics are published as Research Papers 1614, 1621 and 1622 in the Journal of Research of the National Bureau of Standards.

As a result of trials of the method of silicate minerals it was found that decomposition of the albite-anorthite series of plagioclase feldspars was not uniformly graded from complete for anorthite to none for albite. There is an abrupt change at $Ab_{40}An_{60}$ corresponding to about 58 percent silica, above which solution was not appreciable and below which solution was complete. This is thought to be the first clearly defined evidence for "resistance limits" (as shown by Tammann for several series of alloys and for a series of synthetic mixed crystals) in an isomorphous natural mineral replacement series.

K. J. MURATA and W. G. SCHLECHT: *Chemical behavior and crystal structure of silicate minerals.* The two kinds of behavior, gelatinization and separation of insoluble silica, shown by silicate minerals when decomposed by acids, have been correlated with the internal structure and composition of the minerals (Amer. Min. **28**: 545–562. 1943). A further study of 44 minerals with continuous, 3-dimensional silicon-oxygen and aluminum-oxygen structures, such as feldspars and zeolites, has been made, and the way in which the aluminum-silicon ratio determines their behavior is emphasized. Such minerals with an aluminum to silicon ratio smaller than 1:2 will separate insoluble silica, while those richer in aluminum will gelatinize.

On the assumption that the acid treatment dissolves away aluminum from the aluminosilicate structures and leaves behind silicon-oxygen clusters, the gelatinization behavior is thought to depend on the sizes of these clus-